

APPENDIX A
DATA TABLES

Distribution of Noncompliance by Noncompliance Category in 1990

Noncompliance Category	Count of Category
Exceedance	9
Labeling	11
Legal Agreement	1
Operations and Maintenance	32
Late or Incomplete Recordkeeping	16
Report Submissions and Reporting	8
Spill/Release	7
Testing	2
Training and Certification	4
Unpermitted/Unauthorized Activity	6
Waste Identification	4

Distribution of Root Causes of Noncompliance in 1990

Root Cause	Count of Root Cause
Human Error	23
Policies	13
Procedures	51
Management	69
Training and Certification	19
Communications	4
Emergency Preparedness	4
Compliance Monitoring	18
Regulations and Permits	12
Equipment Problems	4

Breakdown of Root Causes of Noncompliance in 1990

Root Cause	Question Number	Count of Root Cause
Human Error	1	11
Human Error	2	3
Human Error	3	9
Policies	5	12
Policies	6	1
Procedures	11	7
Procedures	13	6
Procedures	14	21
Procedures	15	6
Procedures	16	10
Procedures	17	1
Management	20	58
Management	23	7
Management	24	2
Management	25	2
Training and Certification	29	14
Training and Certification	31	4
Training and Certification	32	1
Communications	36	4
Emergency Preparedness	39	4
Compliance Monitoring	47	14
Compliance Monitoring	49	2
Compliance Monitoring	50	2
Regulations and Permits	57	1
Regulations and Permits	62	10
Regulations and Permits	64	1
Equipment Problems	69	3
Equipment Problems	72	1

Distribution of Root Causes of Noncompliance by Noncompliance Category in 1990

Category	Question Number	Counts
Exceedance	20	5
Exceedance	2	2
Exceedance	29	2
Exceedance	47	2
Exceedance	69	2
Exceedance	3	1
Exceedance	24	1
Exceedance	62	1
Exceedance	1	1
Labeling	20	9
Labeling	29	4
Labeling	16	4
Labeling	13	2
Labeling	11	2
Labeling	23	2
Labeling	1	2
Labeling	62	1
Labeling	14	1
Legal Agreement	47	1
Legal Agreement	20	1
Operations and Maintenance	20	22
Operations and Maintenance	14	8
Operations and Maintenance	5	7
Operations and Maintenance	29	6
Operations and Maintenance	1	5
Operations and Maintenance	11	4
Operations and Maintenance	3	4
Operations and Maintenance	47	3
Operations and Maintenance	13	3

**Distribution of Root Causes of Noncompliance by Noncompliance Category
in 1990 (continued)**

Category	Question Number	Counts
Operations and Maintenance	16	3
Operations and Maintenance	25	2
Operations and Maintenance	49	2
Operations and Maintenance	62	2
Operations and Maintenance	69	1
Operations and Maintenance	72	1
Operations and Maintenance	23	1
Late or Incomplete Recordkeeping	20	6
Late or Incomplete Recordkeeping	14	5
Late or Incomplete Recordkeeping	47	3
Late or Incomplete Recordkeeping	36	3
Late or Incomplete Recordkeeping	15	2
Late or Incomplete Recordkeeping	1	2
Late or Incomplete Recordkeeping	39	2
Late or Incomplete Recordkeeping	3	1
Late or Incomplete Recordkeeping	62	1
Report Submissions and Reporting	20	4
Report Submissions and Reporting	15	3
Report Submissions and Reporting	47	2
Report Submissions and Reporting	23	2
Report Submissions and Reporting	50	2
Report Submissions and Reporting	1	1
Report Submissions and Reporting	62	1
Report Submissions and Reporting	3	1
Spill/Release	20	3
Spill/Release	31	2
Spill/Release	39	2
Spill/Release	17	1
Spill/Release	23	1

**Distribution of Root Causes of Noncompliance by Noncompliance Category
in 1990 (continued)**

Category	Question Number	Counts
Spill/Release	24	1
Spill/Release	16	1
Spill/Release	14	1
Spill/Release	47	1
Spill/Release	62	1
Spill/Release	64	1
Spill/Release	36	1
Testing	2	1
Testing	3	1
Testing	5	1
Testing	20	1
Training and Certification	14	4
Training and Certification	31	2
Training and Certification	5	2
Training and Certification	20	2
Training and Certification	15	1
Training and Certification	32	1
Unpermitted/Unauthorized Activity	20	4
Unpermitted/Unauthorized Activity	47	2
Unpermitted/Unauthorized Activity	62	2
Unpermitted/Unauthorized Activity	23	1
Unpermitted/Unauthorized Activity	29	1
Unpermitted/Unauthorized Activity	16	1
Unpermitted/Unauthorized Activity	11	1
Unpermitted/Unauthorized Activity	57	1
Waste Identification	5	2
Waste Identification	14	2
Waste Identification	62	1
Waste Identification	3	1

**Distribution of Root Causes of Noncompliance by Noncompliance Category
in 1990 (continued)**

Category	Question Number	Counts
Waste Identification	6	1
Waste Identification	13	1
Waste Identification	16	1
Waste Identification	20	1
Waste Identification	29	1

Distribution of Contributing Causes of Noncompliance by Noncompliance Category in 1990

Category	Question Number	Counts
Exceedance	49	5
Exceedance	70	3
Exceedance	14	2
Exceedance	47	2
Exceedance	20	2
Exceedance	24	1
Exceedance	25	1
Exceedance	34	1
Exceedance	22	1
Exceedance	21	1
Exceedance	66	1
Labeling	47	11
Labeling	49	8
Labeling	22	6
Labeling	21	6
Labeling	3	5
Labeling	35	4
Labeling	23	4
Labeling	14	4
Labeling	29	3
Labeling	24	2
Labeling	32	2
Labeling	20	2
Labeling	1	1
Labeling	25	1
Labeling	31	1
Legal Agreement	24	1
Legal Agreement	49	1

**Distribution of Contributing Causes of Noncompliance by Noncompliance
Category in 1990 (continued)**

Category	Question Number	Counts
Operations and Maintenance	47	24
Operations and Maintenance	3	15
Operations and Maintenance	49	13
Operations and Maintenance	23	9
Operations and Maintenance	22	9
Operations and Maintenance	29	7
Operations and Maintenance	35	7
Operations and Maintenance	1	7
Operations and Maintenance	14	7
Operations and Maintenance	31	6
Operations and Maintenance	20	5
Operations and Maintenance	24	5
Operations and Maintenance	32	4
Operations and Maintenance	21	3
Operations and Maintenance	12	2
Operations and Maintenance	54	1
Operations and Maintenance	69	1
Operations and Maintenance	62	1
Operations and Maintenance	39	1
Operations and Maintenance	13	1
Operations and Maintenance	8	1
Operations and Maintenance	11	1
Late or Incomplete Recordkeeping	47	9
Late or Incomplete Recordkeeping	62	7
Late or Incomplete Recordkeeping	23	6
Late or Incomplete Recordkeeping	49	6
Late or Incomplete Recordkeeping	22	3
Late or Incomplete Recordkeeping	24	3
Late or Incomplete Recordkeeping	60	2

**Distribution of Contributing Causes of Noncompliance by Noncompliance
Category in 1990 (continued)**

Category	Question Number	Counts
Late or Incomplete Recordkeeping	3	2
Late or Incomplete Recordkeeping	21	2
Late or Incomplete Recordkeeping	31	2
Late or Incomplete Recordkeeping	1	1
Late or Incomplete Recordkeeping	55	1
Late or Incomplete Recordkeeping	15	1
Late or Incomplete Recordkeeping	29	1
Report Submissions and Reporting	3	2
Report Submissions and Reporting	47	2
Report Submissions and Reporting	29	2
Report Submissions and Reporting	11	2
Report Submissions and Reporting	49	2
Report Submissions and Reporting	22	2
Report Submissions and Reporting	54	1
Report Submissions and Reporting	1	1
Report Submissions and Reporting	62	1
Report Submissions and Reporting	14	1
Report Submissions and Reporting	36	1
Report Submissions and Reporting	31	1
Report Submissions and Reporting	20	1
Report Submissions and Reporting	23	1
Report Submissions and Reporting	21	1
Spill/Release	47	3
Spill/Release	29	2
Spill/Release	55	1
Spill/Release	49	1
Spill/Release	62	1
Spill/Release	35	1
Spill/Release	31	1

**Distribution of Contributing Causes of Noncompliance by Noncompliance
Category in 1990 (continued)**

Category	Question Number	Counts
Spill/Release	2	1
Spill/Release	3	1
Testing	14	2
Testing	22	1
Testing	23	1
Testing	17	1
Testing	16	1
Testing	21	1
Testing	31	1
Training and Certification	29	2
Training and Certification	47	2
Training and Certification	22	2
Training and Certification	20	2
Training and Certification	21	1
Training and Certification	3	1
Training and Certification	31	1
Unpermitted/Unauthorized Activity	49	3
Unpermitted/Unauthorized Activity	23	2
Unpermitted/Unauthorized Activity	3	2
Unpermitted/Unauthorized Activity	54	1
Unpermitted/Unauthorized Activity	50	1
Unpermitted/Unauthorized Activity	47	1
Unpermitted/Unauthorized Activity	67	1
Unpermitted/Unauthorized Activity	22	1
Unpermitted/Unauthorized Activity	14	1
Unpermitted/Unauthorized Activity	5	1
Unpermitted/Unauthorized Activity	1	1
Unpermitted/Unauthorized Activity	24	1
Unpermitted/Unauthorized Activity	30	1

**Distribution of Contributing Causes of Noncompliance by Noncompliance
Category in 1990 (continued)**

Category	Question Number	Counts
Waste Identification	47	2
Waste Identification	3	1
Waste Identification	54	1
Waste Identification	51	1
Waste Identification	49	1
Waste Identification	35	1
Waste Identification	31	1
Waste Identification	22	1
Waste Identification	1	1
Waste Identification	55	1
Waste Identification	23	1

Distribution of Contributing Causes of Noncompliance in 1990

Contributing Cause	Count of Contributing Cause
Human Error	42
Policies	132
Procedures	26
Management	92
Training and Certification	38
Communications	15
Emergency Preparedness	1
Compliance Monitoring	98
Regulations and Permits	19
External Circumstances	2
Equipment Problems	4

Breakdown of Contributing Causes of Noncompliance in 1990

Contributing Cause	Question Number	Count of Contributing Cause
Human Error	1	12
Human Error	2	1
Human Error	3	29
Policies	5	1
Policies	8	1
Procedures	11	3
Procedures	12	2
Procedures	13	1
Procedures	14	17
Procedures	15	1
Procedures	16	1
Procedures	17	1
Management	20	12
Management	21	15
Management	22	26
Management	23	24
Management	24	13
Management	25	2
Training and Certification	29	17
Training and Certification	30	1
Training and Certification	31	14
Training and Certification	32	6
Communications	34	1
Communications	35	13
Communications	36	1
Emergency Preparedness	39	1
Compliance Monitoring	47	56
Compliance Monitoring	49	40
Compliance Monitoring	50	1

Breakdown of Contributing Causes of Noncompliance in 1990 (continued)

Contributing Cause	Question Number	Count of Contributing Cause
Compliance Monitoring	51	1
Regulations and Permits	54	4
Regulations and Permits	55	3
Regulations and Permits	60	2
Regulations and Permits	62	10
External Circumstances	66	1
External Circumstances	67	1
Equipment Problems	69	1
Equipment Problems	70	3

Distribution of Noncompliance by Noncompliance Category in 1998

Noncompliance Category	Count of Category
Equipment/Unit Design	2
Exceedance	16
Labeling	4
Monitoring	8
Operations and Maintenance	17
Record Keeping	21
Report Submissions and Reporting	20
Spill/Release	3
Training and Certification	1
Unpermitted/Unauthorized Activity	3

Distribution of Root Causes of Noncompliance in 1998

Root Cause	1998 Count Of Root Cause
Human Error	31
Policies	2
Procedures	31
Management	8
Communications	8
Emergency Preparedness	1
Process Upset or Failure	3
Compliance Monitoring	6
Regulations and Permits	38
External Circumstances	4
Equipment Problems	9

Breakdown of Root Causes of Noncompliance in 1998

Root Cause	Question Number	Count of Root Cause
Human Error	1	27
Human Error	2	2
Human Error	3	2
Policies	9	2
Procedures	11	20
Procedures	12	2
Procedures	13	2
Procedures	14	2
Procedures	15	5
Management	20	1
Management	23	2
Management	24	4
Management	25	1
Communications	34	2
Communications	36	3
Communications	37	3
Emergency Preparedness	39	1
Process Upset or Failure	45	1
Process Upset or Failure	46	2
Compliance Monitoring	47	1
Compliance Monitoring	49	2
Compliance Monitoring	50	3
Regulations and Permits	54	4
Regulations and Permits	55	7
Regulations and Permits	58	1
Regulations and Permits	60	2
Regulations and Permits	61	6

Breakdown of Root Causes of Noncompliance in 1998 (continued)

Root Cause	Question Number	Count of Root Cause
Regulations and Permits	62	12
Regulations and Permits	64	6
External Circumstances	67	4
Equipment Problems	69	4
Equipment Problems	70	2
Equipment Problems	71	2
Equipment Problems	72	1

Distribution of Root Causes of Noncompliance by Noncompliance Category in 1998

Category	Question Number	Counts
Equipment/Unit Design	12	1
Equipment/Unit Design	55	1
Equipment/Unit Design	11	1
Exceedance	69	4
Exceedance	61	3
Exceedance	24	3
Exceedance	70	2
Exceedance	46	2
Exceedance	1	2
Exceedance	36	1
Exceedance	37	1
Exceedance	20	1
Exceedance	12	1
Exceedance	9	1
Exceedance	71	1
Exceedance	45	1
Labeling	11	3
Labeling	1	1
Monitoring	62	3
Monitoring	11	2
Monitoring	49	2
Monitoring	64	1
Monitoring	60	1
Monitoring	14	1
Monitoring	13	1
Monitoring	1	1
Monitoring	24	1

**Distribution of Root Causes of Noncompliance by Noncompliance Category in 1998
(continued)**

Category	Question Number	Counts
Monitoring	9	1
Operations and Maintenance	1	8
Operations and Maintenance	11	3
Operations and Maintenance	62	2
Operations and Maintenance	47	1
Operations and Maintenance	39	1
Operations and Maintenance	34	1
Operations and Maintenance	25	1
Operations and Maintenance	3	1
Operations and Maintenance	2	1
Operations and Maintenance	61	1
Operations and Maintenance	15	1
Operations and Maintenance	60	1
Late or Incomplete Recordkeeping	55	5
Late or Incomplete Recordkeeping	1	5
Late or Incomplete Recordkeeping	11	5
Late or Incomplete Recordkeeping	54	4
Late or Incomplete Recordkeeping	15	3
Late or Incomplete Recordkeeping	23	2
Late or Incomplete Recordkeeping	62	2
Late or Incomplete Recordkeeping	64	2
Late or Incomplete Recordkeeping	34	1
Late or Incomplete Recordkeeping	37	1
Late or Incomplete Recordkeeping	2	1
Late or Incomplete Recordkeeping	50	1
Report Submissions and Reporting	1	7
Report Submissions and Reporting	67	4
Report Submissions and Reporting	11	4

**Distribution of Root Causes of Noncompliance by Noncompliance Category in 1998
(continued)**

Category	Question Number	Counts
Report Submissions and Reporting	62	3
Report Submissions and Reporting	50	2
Report Submissions and Reporting	58	1
Report Submissions and Reporting	15	1
Report Submissions and Reporting	14	1
Report Submissions and Reporting	3	1
Report Submissions and Reporting	37	1
Report Submissions and Reporting	36	1
Spill/Release	62	1
Spill/Release	72	1
Spill/Release	64	1
Spill/Release	61	1
Spill/Release	55	1
Spill/Release	11	1
Spill/Release	1	1
Spill/Release	71	1
Training and Certification	11	1
Unpermitted/Unauthorized Activity	64	2
Unpermitted/Unauthorized Activity	1	2
Unpermitted/Unauthorized Activity	13	1
Unpermitted/Unauthorized Activity	36	1
Unpermitted/Unauthorized Activity	61	1
Unpermitted/Unauthorized Activity	62	1

Distribution of Contributing Causes of Noncompliance in 1998

Contributing Cause	Count of Contributing Cause
Human Error	20
Policies	4
Procedures	24
Training	4
Management	16
Communications	8
Emergency Preparedness	2
Compliance Monitoring	15
Regulations and Permits	9
External Circumstances	3
Equipment Problems	2

Breakdown of Contributing Causes of Noncompliance in 1998

Category	Question Number	Count
Human Error	1	13
Human Error	2	4
Human Error	3	3
Policies	9	4
Procedures	11	5
Procedures	12	1
Procedures	13	11
Procedures	15	1
Procedures	16	3
Procedures	17	2
Procedures	19	1
Management	23	7
Management	24	7
Management	26	1
Management	27	1
Training	30	1
Training	32	1
Training	33	2
Communication	34	4
Communication	35	2
Communication	36	1
Communication	37	1
Emergency Preparedness	40	2
Compliance Monitoring	47	1
Compliance Monitoring	49	13
Compliance Monitoring	52	1
Regulations and Permits	54	1
Regulations and Permits	55	3
Regulations and Permits	60	2
Regulations and Permits	62	2
Regulations and Permits	64	1
External Circumstances	65	1

Breakdown of Contributing Causes of Noncompliance in 1998 (continued)

Category	Question Number	Count
External Circumstances	66	1
External Circumstances	67	1
Equipment problems	70	1
Equipment problems	72	1

Distribution of Contributing Causes by Noncompliance Category in 1998

Category	Question Number	Counts
Equipment/Unit Design	40	1
Equipment/Unit Design	49	1
Equipment/Unit Design	1	1
Exceedance	24	4
Exceedance	9	4
Exceedance	62	2
Exceedance	13	1
Exceedance	11	1
Exceedance	66	1
Exceedance	2	1
Exceedance	27	1
Labeling	33	2
Labeling	3	1
Labeling	13	1
Monitoring	1	3
Monitoring	13	1
Monitoring	49	1
Monitoring	2	1
Monitoring	16	1
Monitoring	24	1
Operations and Maintenance	23	5
Operations and Maintenance	13	4
Operations and Maintenance	49	4
Operations and Maintenance	60	2
Operations and Maintenance	1	2
Operations and Maintenance	11	2
Operations and Maintenance	35	2

Distribution of Contributing Causes by Noncompliance Category in 1998 (continued)

Category	Question Number	Counts
Operations and Maintenance	24	1
Operations and Maintenance	55	1
Operations and Maintenance	40	1
Operations and Maintenance	34	1
Operations and Maintenance	26	1
Operations and Maintenance	72	1
Operations and Maintenance	32	1
Operations and Maintenance	70	1
Late or Incomplete Recordkeeping	49	4
Late or Incomplete Recordkeeping	1	3
Late or Incomplete Recordkeeping	13	3
Late or Incomplete Recordkeeping	34	2
Late or Incomplete Recordkeeping	23	2
Late or Incomplete Recordkeeping	16	2
Late or Incomplete Recordkeeping	3	2
Late or Incomplete Recordkeeping	17	1
Late or Incomplete Recordkeeping	12	1
Late or Incomplete Recordkeeping	55	1
Late or Incomplete Recordkeeping	2	1
Late or Incomplete Recordkeeping	47	1
Report Submissions and Reporting	49	3
Report Submissions and Reporting	1	3
Report Submissions and Reporting	19	1
Report Submissions and Reporting	67	1
Report Submissions and Reporting	65	1
Report Submissions and Reporting	64	1
Report Submissions and Reporting	52	1
Report Submissions and Reporting	37	1

Distribution of Contributing Causes by Noncompliance Category in 1998 (continued)

Category	Question Number	Counts
Report Submissions and Reporting	34	1
Report Submissions and Reporting	24	1
Report Submissions and Reporting	13	1
Report Submissions and Reporting	11	1
Report Submissions and Reporting	30	1
Spill/Release	1	1
Spill/Release	11	1
Spill/Release	36	1
Spill/Release	55	1
Training and Certification	15	1
Training and Certification	17	1
Unpermitted/Unauthorized Activity	54	1
Unpermitted/Unauthorized Activity	2	1